

## PCT

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

REC'D 05 MAY 2004



WIPO PCT

Applicant's or agent's file reference INT1072/MAJR	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA/416)	
International application No. PCT/ZA 02/00209	International filing date (day/month/year) 17.12.2002	Priority date (day/month/year) 03.01.2002
International Patent Classification (IPC) or both national classification and IPC E21C37/14		
Applicant VAN DYK, Andre		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 5 sheets, including this cover sheet.
  - ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 3 sheets.

3. This report contains indications relating to the following items:
  - I ☒ Basis of the opinion
  - II ☐ Priority
  - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
  - IV ☐ Lack of unity of invention
  - V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
  - VI ☐ Certain documents cited
  - VII ☐ Certain defects in the international application
  - VIII ☐ Certain observations on the international application

Date of submission of the demand  01.08.2003	Date of completion of this report  03.05.2004
Name and mailing address of the international preliminary examining authority:   European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016	Authorized Officer  Garrido Garcia, M  Telephone No. +31 70 340-4468  

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. **PCT/ZA 02/00209**

**J. Basis of the report**

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17):*

**Description, Pages**

1-13 as originally filed

**Claims, Numbers**

2-8, 10-15 as originally filed  
1, 9 filed with telefax on 03.02.2004

**Drawings, Sheets**

1/4-4/4 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

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5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

*(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

6. Additional observations, if necessary:

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

**1. Statement**

Novelty (N)	Yes: Claims	1-15
	No: Claims	
Inventive step (IS)	Yes: Claims	1-15
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-15
	No: Claims	

**2. Citations and explanations**

**see separate sheet**

**Re Item V**

**Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

Reference is made to the following document:

D1: WO 95 28551 A

The document **D1** is regarded as being the closest prior art to the subject-matter of claim 1, and shows (the references in parentheses applying to this document): a stemming apparatus for use with a first propellant charge (4) that is positioned in a hole, which includes a member (3), and an initiator (2) for igniting the first propellant charge (see page 30, line 27) which then acts on the member (3) in a predetermined direction (the first propellant charge (4) of document D1 will act upwards on the member (3) when ignited).

The subject-matter of claim 1 differs from this known stemming apparatus in that a second propellant charge is incorporated in the member that, when ignited, will act on the member to counteract a force produced by ignition of the first propellant charge.

The subject-matter of claim 1 is therefore new (Article 33(2) PCT).

The problem to be solved by the present invention may be regarded as improving the efficiency with which rock is broken by increasing the degree to which pressure generated by the combusting propellant is confined within the blast hole.

The solution to this problem proposed in claim 1 of the present application consists of providing a second propellant charge to act on the member to counteract a force produced by ignition of the first propellant charge.

This solution is considered as involving an inventive step (Article 33(3) PCT) for the following reasons: All of the prior art documents disclose stemming apparatus whereby a single propellant charge is used, the force of which is confined by tamping or by stemming bars (see document D1). There is no hint in the art on how to modify the known stemming apparatus in a way that would fall within the terms of claim 1, so that the person skilled would be more likely to further increase the weight or the

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compactness of the tamping if he wished to raise the degree of confinement of the pressure generated by the propellant.

Claims 2 to 8 are dependent on claim 1 and as such also meet the requirements of the PCT with respect to novelty and inventive step.

Independent claim 9 refers to a method of stemming describing the steps for carrying out a stemming using an apparatus as claimed in claim 1, and is new and inventive for the same reasons set out above for claim 1. Claims 10 to 15 are dependent on claim 9 and as such also meet the requirements of the PCT with respect to novelty and inventive step.

The amendments introduced in claims 1 and 9 are constrained to subject-matter disclosed in the international application as filed, and are therefore in conformity with Articles 19(2) and 34(2) PCT.

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CLAIMS

1. Stemming apparatus for use with a first propellant charge which is positioned in a hole which includes a member, a second propellant charge incorporated in the member, and an initiator for igniting the second propellant charge which then acts on the member in a predetermined direction to counteract a force produced by ignition of the first propellant charge.
2. Stemming apparatus according to claim 1 wherein the member is driven by the ignited propellant charge in the predetermined direction.
3. Stemming apparatus according to claim 1 or 2 wherein the member includes a tapered leading end or formation on a side which faces in the predetermined direction.
4. Stemming apparatus according to claim 3 wherein the member is conically shaped on the tapered leading end.
5. Stemming apparatus according to claim 3 or 4 wherein the member is constructed so that it is capable of flaring outwardly when moved in a direction which is opposite to the predetermined direction.
6. Stemming apparatus according to claim 1 wherein the member is shaped so that a gas generated force is produced by the ignited propellant in a direction which is opposite to the predetermined direction.

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7. Stemming apparatus according to claim 6 wherein the member includes a recessed formation which contains the propellant charge.
8. Stemming apparatus according to any one of claims 1 to 7 which includes control means for controlling the firing of the initiator, the control means including an energy source and a timer for applying energy from the energy source to the initiator at a predetermined time.
9. A method of stemming which includes the steps of placing stemming material in a hole over a cartridge which includes a first propellant charge, positioning at least one member on the stemming material and igniting a second propellant charge, which is incorporated in the member, at a predetermined time relatively to the time at which the first propellant charge is initiated whereby the member exerts a force on the stemming which counteracts a force on the stemming produced by initiation of the first propellant charge.
10. A method according to claim 9 wherein a short time interval exists between the time at which the second propellant charge is ignited and the time at which the first propellant charge is initiated.
11. A method according to claim 9 wherein the first propellant charge is initiated substantially at the same time as the second propellant charge is ignited.
12. A method according to any one of claims 9 to 11 wherein the member is between the stemming material and the second propellant charge.
13. A method according to claim 12 wherein the second propellant charge is used to drive the member in a direction towards the cartridge.

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14. A method according to any one of claims 9 to 11 wherein the second propellant charge is between the stemming material and the member.
15. A method according to claim 14 wherein the second propellant charge is used to produce a gas generated force which is directed towards the cartridge.

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